

**IN THE CLAIMS:**

Please amend the claims as follows:

1. (Currently amended) A method of producing a polymer-clay nanocomposite, comprising the steps of:  
providing a ~~supply of~~ polymer-clay mixture comprising a polymer and clay;  
exfoliating the ~~mixture~~ clay through solid-state shear pulverization in the presence of cooling sufficient to maintain the ~~extruded~~ mixture in the solid state during the pulverization; and  
discharging the resulting exfoliated mixture as a polymer-clay nanocomposite containing the exfoliated clay.
2. (Cancelled)
3. (Currently amended) The method of claim 1, wherein the ~~polymer-clay~~ mixture comprises at least about 3 wt% organoclay.
4. (Currently amended) The method of claim 1, wherein the ~~polymer-clay~~ mixture comprises about 10 wt% organoclay.
5. (Currently amended) The method of claim 3, wherein the organoclay contains between about 40-50 wt% clay and between about 50-60 wt% organic content.

6. (Original) The method of claim 5, wherein the organoclay is a montmorillonite.

7. (Original) The method of claim 1, wherein the polymer-clay mixture comprises a polymer selected from the group consisting of polypropylene, polyolefins, polystyrene, polymethacrylates, poly(ethylene-co-vinyl acetate), polyhydroxystyrene, poly(vinyl pyridine), polyvinylalcohol, polyacrylamide, polycaprolactone, copolymers of ethylene, copolymers of propylene, copolymers of acetate, poly(ethylene terephthalate), nylon, and blends thereof.

8. (Currently amended) The method of claim 1, including the further comprising a step of cooling a pulverizer barrel with a chilled fluid at to about 10° Celsius during the pulverization.

9-17. (Canceled)

18. (New) The method of claim 1, wherein the clay comprises an organoclay, and wherein the polymer comprises a nonpolar polymer.

19. (New) A method of producing a polymer-clay nanocomposite, comprising the steps of:

melt extruding a polymer-clay mixture comprising a polymer and clay;

exfoliating the clay through solid-state shear pulverization in the presence of cooling sufficient to maintain the mixture in the solid state during the pulverization; and discharging the mixture as a polymer-clay nanocomposite containing the exfoliated clay.

20. (New) The method of claim 19, wherein the mixture comprises at least about 3 wt% organoclay.

21. (New) The method of claim 19, wherein the mixture comprises about 10 wt% organoclay.

22. (New) The method of claim 20, wherein the organoclay contains between about 40-50 wt% clay and between about 50-60 wt% organic content.

23. (New) The method of claim 22, wherein the organoclay is a montmorillonite.

24. (New) The method of claim 19, wherein the polymer-clay mixture comprises a polymer selected from the group consisting of polypropylene, polyolefins, polystyrene, polymethacrylates, poly(ethylene-co-vinyl acetate), polyhydroxystyrene, poly(vinyl pyridine), polyvinylalcohol, polyacrylamide, polycaprolactone, copolymers of ethylene, copolymers of propylene, copolymers of acetate, poly(ethylene terephthalate), nylon, and blends thereof.

25. (New) The method of claim 19, further comprising a step of cooling a pulverizer barrel with a chilled fluid to about 10° Celsius during the pulverization.

26. (New) The method of claim 19, wherein the clay comprises an organoclay, and wherein the polymer comprises a nonpolar polymer.